

11/18/98  
jc618 U.S. PTO

Practitioner's Docket No. 555-008357-US(PAR)

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Box Patent Application  
Assistant Commissioner for Patents  
Washington, D.C. 20231

jc551 U.S. PTO  
09/19398  
11/18/98

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of  
Inventor(s): John Rexroad

**WARNING:** 37 C.F.R. § 1.41(a)(1) points out:

"(a) A patent is applied for in the name or names of the actual inventor or inventors.

"(1) The inventorship of a nonprovisional application is that inventorship set forth in the oath or declaration as prescribed by § 1.63, except as provided for in § 1.53(d)(4) and § 1.63(d). If an oath or declaration as prescribed by § 1.63 is not filed during the pendency of a nonprovisional application, the inventorship is that inventorship set forth in the application papers filed pursuant to § 1.53(b), unless a petition under this paragraph accompanied by the fee set forth in § 1.17(f) is filed supplying or changing the name or names of the inventor or inventors."

For (title): Shrink-Net and System

**CERTIFICATION UNDER 37 C.F.R. 1.10\***

(Express Mail label number is mandatory.)

(Express Mail certification is optional.)

I hereby certify that this New Application Transmittal and the documents referred to as attached therein are being deposited with the United States Postal Service on this date 11/18/98 in an envelope as "Express Mail Post Office to Addressee," mailing Label Number E1067098165US addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

MAUREEN EGAN

(type or print name of person mailing paper)

M Egan

Signature of person mailing paper

**WARNING:** Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

**\*WARNING:** Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).

"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

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09193989-111898

## 1. Type of Application

This new application is for a(n)

(check one applicable item below)

☒ Original (nonprovisional)

☐ Design

☐ Plant

**WARNING:** Do not use this transmittal for a completion in the U.S. of an International Application under 35 U.S.C. 371(c)(4), unless the International Application is being filed as a divisional, continuation or continuation-in-part application.

**WARNING:** Do not use this transmittal for the filing of a provisional application.

**NOTE:** If one of the following 3 items apply, then complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF A PRIOR U.S. APPLICATION CLAIMED and a NOTIFICATION IN PARENT APPLICATION OF THE FILING OF THIS CONTINUATION APPLICATION.

☐ Divisional.

☐ Continuation.

☐ Continuation-in-part (C-I-P).

## 2. Benefit of Prior U.S. Application(s) (35 U.S.C. 119(e), 120, or 121)

**NOTE:** A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or copending international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or copending international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. 112. Each prior application must also be:

(i) An international application entitled to a filing date in accordance with PCT Article 11 and designating the United States of America; or

(ii) Complete as set forth in § 1.51(b); or

(iii) Entitled to a filing date as set forth in § 1.53(b) or § 1.53(d) and include the basic filing fee set forth in § 1.16; or

(iv) Entitled to a filing date as set forth in § 1.53(b) and have paid therein the processing and retention fee set forth in § 1.21(f) within the time period set forth in § 1.53(f).

37 C.F.R. § 1.78(a)(1).

**NOTE:** If the new application being transmitted is a divisional, continuation or a continuation-in-part of a parent case, or where the parent case is an International Application which designated the U.S., or benefit of a prior provisional application is claimed, then check the following item and complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

**WARNING:** If an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. 120, 121 or 365(c), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. 120, 121 or 365(c). (35 U.S.C. 154(a)(2) does not take into account, for the determination of the patent term, any application on which priority is claimed under 35 U.S.C. 119, 365(a) or 365(b).) For a c-i-p application, applicant should review whether any claim in the patent that will issue is supported by an earlier application and, if not, the applicant should consider canceling the reference to the earlier filed application. The term of a patent is not based on a claim-by-claim approach. See Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,205.

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a) $\alpha$ -methylstyrene	
run	temp. (°C)
1	100
2	100
3	100
4	100
5	100
6	100
7	100
8	100
9	100
10	100
11	100
12	100
13	100
14	100
15	100
16	100
17	100
18	100
19	100
20	100
21	100
22	100
23	100
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89	100
90	100
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93	100
94	100
95	100
96	100
97	100
98	100
99	100
100	100

- ☐ The new application being transmitted claims the benefit of prior U.S. application(s). Enclosed are ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

### 3. Papers Enclosed

- A. Required for filing date under 37 C.F.R. § 1.53(b) (Regular) or 37 C.F.R. § 1.153 (Design) Application

15 Pages of specification

7 Pages of claims

9 Sheets of drawing

**WARNING:** *DO NOT submit original drawings. A high quality copy of the drawings should be supplied when filing a patent application. The drawings that are submitted to the Office must be on strong, white, smooth, and non-shiny paper and meet the standards according to § 1.84. If corrections to the drawings are necessary, they should be made to the original drawing and a high-quality copy of the corrected original drawing then submitted to the Office. Only one copy is required or desired. For comments on proposed then-new 37 CFR 1.84, see Notice of March 9, 1988 (1990 O.G. 57-62).*

NOTE: "Identifying indicia, if provided, should include the application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application. This information should be placed on the back of each sheet of drawing a minimum distance of 1.5 cm. (5/8 inch) down from the top of the page . . ." 37 C.F.R. 1.84(c)).

(complete the following, if applicable)

- ☐ The enclosed drawing(s) are photograph(s), and there is also attached a "PETITION TO ACCEPT PHOTOGRAPH(S) AS DRAWING(S)." 37 C.F.R. 1.84(b).
- ☐ formal
- ☐ informal

**B. Other Papers Enclosed**

7 Pages of declaration and power of attorney

1 Pages of abstract

\_\_\_\_\_ Other

**4. Additional papers enclosed**

- ☐ Amendment to claims
- ☐ Cancel in this applications claims \_\_\_\_\_ before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)
- ☐ Add the claims shown on the attached amendment. (Claims added have been numbered consecutively following the highest numbered original claims.)
- ☐ Preliminary Amendment
- ☐ Information Disclosure Statement (37 C.F.R. 1.98)
- ☐ Form PTO-1449 (PTO/SB/08A and 08B)
- ☐ Citations

- ☐ Declaration of Biological Deposit
- ☐ Submission of "Sequence Listing," computer readable copy and/or amendment pertaining thereto for biotechnology invention containing nucleotide and/or amino acid sequence.
- ☐ Authorization of Attorney(s) to Accept and Follow Instructions from Representative
- ☐ Special Comments
- ☐ Other

**5. Declaration or oath (including power of attorney)**

*NOTE: A newly executed declaration is not required in a continuation or divisional application provided that the prior nonprovisional application contained a declaration as required, the application being filed is by all or fewer than all the inventors named in the prior application, there is no new matter in the application being filed, and a copy of the executed declaration filed in the prior application (showing the signature or an indication thereon that it was signed) is submitted. The copy must be accompanied by a statement requesting deletion of the names of person(s) who are not inventors of the application being filed. If the declaration in the prior application was filed under § 1.47, then a copy of that declaration must be filed accompanied by a copy of the decision granting § 1.47 status or, if a nonsigning person under § 1.47 has subsequently joined in a prior application, then a copy of the subsequently executed declaration must be filed. See 37 C.F.R. §§ 1.63(d)(1)-(3).*

*NOTE: A declaration filed to complete an application must be executed, identify the specification to which it is directed, identify each inventor by full name including family name and at least one given name, without abbreviation together with any other given name or initial, and the residence, post office address and country or citizenship of each inventor, and state whether the inventor is a sole or joint inventor. 37 C.F.R. § 1.63(a)(1)-(4).*

☒ Enclosed

Executed by

(check all applicable boxes)

- ☐ inventor(s).
- ☐ legal representative of inventor(s).  
37 CFR 1.42 or 1.43.
- ☐ joint inventor or person showing a proprietary interest on behalf of inventor who refused to sign or cannot be reached.
  - ☐ This is the petition required by 37 CFR 1.47 and the statement required by 37 CFR 1.47 is also attached. See item 13 below for fee.

☒ Not Enclosed.

*NOTE: Where the filing is a completion in the U.S. of an International Application or where the completion of the U.S. application contains subject matter in addition to the International Application, the application may be treated as a continuation or continuation-in-part, as the case may be, utilizing ADDED PAGE FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION CLAIMED.*

- ☐ Application is made by a person authorized under 37 C.F.R. 1.41(c) on behalf of all the above named inventor(s).

(The declaration or oath, along with the surcharge required by 37 CFR 1.16(e) can be filed subsequently).

- ☐ Showing that the filing is authorized.  
(not required unless called into question. 37 CFR 1.41(d))



## 9. Certified Copy

Certified copy(ies) of application(s)

Country	Appln. No.	Filed
Country	Appln. No.	Filed
Country	Appln. No.	Filed

from which priority is claimed

☐ is (are) attached.

☐ will follow.

NOTE: The foreign application forming the basis for the claim for priority must be referred to in the oath or declaration. 37 CFR 1.55(a) and 1.63.

NOTE: This item is for any foreign priority for which the application being filed directly relates. If any parent U.S. application or International Application from which this application claims benefit under 35 U.S.C. 120 is itself entitled to priority from a prior foreign application, then complete item 18 on the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

## 10. Fee Calculation (37 C.F.R. 1.16)

A. ☒ Regular application

CLAIMS AS FILED			
Number filed	Number Extra	Rate	Basic Fee 37 C.F.R. 1.16(a) \$790.00
Total			
Claims (37 CFR 1.16(c)) 20- 20 =	0	×	\$ 22.00
Independent			
Claims (37 CFR 1.16(b)) 3- 3 =	0	×	\$ 82.00
Multiple dependent claim(s), if any (37 CFR 1.16(d))		+	\$270.00

☐ Amendment cancelling extra claims is enclosed.

☐ Amendment deleting multiple-dependencies is enclosed.

☐ Fee for extra claims is not being paid at this time.

NOTE: If the fees for extra claims are not paid on filing they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Patent and Trademark Office in any notice of fee deficiency. 37 CFR 1.16(d).

Filing Fee Calculation \$ 790.00

B. ☐ Design application  
(\$330.00—37 CFR 1.16(f))

Filing Fee Calculation \$

C. ☐ Plant application  
(\$540.00—37 CFR 1.16(g))

Filing fee calculation \$

[illegible]

- WARNING:** *"Status as a small entity must be specifically established in each application or patent in which the status is available and desired. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. The refiling of an application under § 1.53 as a continuation, division, or continuation-in-part (including a continued prosecution application under § 1.53(d)), or the filing of a reissue application requires a new determination as to continued entitlement to small entity status for the continuing or reissue application. A nonprovisional application claiming benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) of a prior application, or a reissue application may rely on a statement filed in the prior application or in the patent if the nonprovisional application or the reissue application includes a reference to the statement in the prior application or in the patent or includes a copy of the statement in the prior application or in the patent and status as a small entity is still proper and desired. The payment of the small entity basic statutory filing fee will be treated as such a reference for purposes of this section." 37 C.F.R. § 1.28(a)(2).*

☐ Status as a small entity was claimed in prior application  
\_\_\_\_\_ / \_\_\_\_\_, filed on \_\_\_\_\_, from which benefit  
is being claimed for this application under:

and which status as a small entity is still proper and desired.

- Filing Fee Calculation (50% of A, B or C above)**

**NOTE:** Any excess of the full fee paid will be refunded if small entity status is established and a refund request is filed within 2 months of the date of timely payment of a full fee. The two-month period is not extendable under § 1.136. 37 CFR 1.28(a).

(complete, if applicable)

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Table 1. (continued)	
Variable	Mean (SD)
Age	34.5 (10.5)
Gender	Male 50.0%
Marital status	Married 65.0%
Education	High school 15.0%
Occupation	Unemployed 10.0%
Income	\$10,000-\$15,000 15.0%
Health status	Good 60.0%
Smoking status	Smoker 30.0%
Alcohol consumption	Alcohol 20.0%
Exercise	Exercise 10.0%
Stress	Stress 15.0%
Depression	Depression 10.0%
Loneliness	Loneliness 15.0%
Life satisfaction	Life satisfaction 10.0%
Quality of life	Quality of life 15.0%
Health-related quality of life	Health-related quality of life 10.0%
Physical health	Physical health 15.0%
Mental health	Mental health 10.0%
Social health	Social health 15.0%
Emotional health	Emotional health 10.0%
Overall health	Overall health 15.0%
Health status	Health status 10.0%
Smoking status	Smoking status 15.0%
Alcohol consumption	Alcohol consumption 10.0%
Exercise	Exercise 15.0%
Stress	Stress 10.0%
Depression	Depression 15.0%
Loneliness	Loneliness 10.0%
Life satisfaction	Life satisfaction 15.0%
Quality of life	Quality of life 10.0%
Health-related quality of life	Health-related quality of life 15.0%
Physical health	Physical health 10.0%
Mental health	Mental health 15.0%
Social health	Social health 10.0%
Emotional health	Emotional health 15.0%
Overall health	Overall health 10.0%

- NOTE: 37 CFR 1.21(f) establishes a fee for processing and retaining any application that is abandoned for failing to complete the application pursuant to 37 CFR 1.53(f) and this, as well as the changes to 37 CFR 1.53 and 1.78(a)(1), indicate that in order to obtain the benefit of a prior U.S. application, either the basic filing fee must be paid, or the processing and retention fee of § 1.21(f) must be paid, within 1 year from notification under § 53(f).

#### 14. Method of Payment of Fees

- NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37 CFR 1.22(b).



## 15. Authorization to Charge Additional Fees

**WARNING:** If no fees are to be paid on filing, the following items should not be completed.

**WARNING:** Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges, if extra claim charges are authorized.

- ☒ The Commissioner is hereby authorized to charge the following additional fees by this paper and during the entire pendency of this application to Account No. 16-1350.

☒ 37 C.F.R. 1.16(a), (f) or (g) (filing fees)

☒ 37 C.F.R. 1.16(b), (c) and (d) (presentation of extra claims)

**NOTE:** Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 CFR 1.16(d)), it might be best not to authorize the PTO to charge additional claim fees, except possibly when dealing with amendments after final action.

☒ 37 C.F.R. 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

☒ 37 C.F.R. §§ 1.17(a)(1)–(5) (extension fees pursuant to § 1.136(a)).

☒ 37 C.F.R. 1.17 (application processing fees)

**NOTE:** ". . . A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).

☐ 37 C.F.R. 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. 1.311(b))

**NOTE:** Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 CFR 1.311(b).


**NOTE:** 37 CFR 1.28(b) requires "Notification of any change in status resulting in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying, . . . the issue fee. . . ." From the wording of 37 CFR 1.28(b), (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

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☒ Credit Account No. 16-1350  
☐ Refund

  
SIGNATURE OF PRACTITIONER

Joseph A. Fischetti  
(type or print name of attorney)

Perman & Green, LLP  
P.O. Address 425 Post Road

Fairfield, CT 06430

(Application Transmittal [4-1]—page 10 of 11)

☐ **Incorporation by reference of added pages**

*(check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED)*

- ☐ Plus Added Pages for New Application Transmittal Where Benefit of Prior U.S. Application(s) Claimed

Number of pages added \_\_\_\_\_

- ☐ Plus Added Pages for Papers Referred to in Item 4 Above

Number of pages added \_\_\_\_\_

- ☐ Plus added pages deleting names of inventor(s) named in prior application(s) who is/are no longer inventor(s) of the subject matter claimed in this application.

Number of pages added \_\_\_\_\_

- ☐ Plus "Assignment Cover Letter Accompanying New Application"

Number of pages added \_\_\_\_\_

☐ **Statement Where No Further Pages Added**

*(if no further pages form a part of this Transmittal, then end this Transmittal with this page and check the following item)*

- ☒ This transmittal ends with this page.

**Shrink-Net and System**BACKGROUND OF THE INVENTION

## 1. Field of the Invention

The present invention relates to an improvement in a netting system, and relates more particularly, to improvements in mesh netting whereby the mesh is capable of being made of taught around a frame through the intermediary of a shrinkable net fiber which has a reduced length when wetted and then dried.

It is often desirable to maintain a net mesh in a taut condition while it is held in place on a structure. Typically, for example, in the case of a barrier net used for holding people from going over a ledge, it is desirable to maintain the person without him or her leaning over a ledge. In prior art nets, play in the net would undesirably allow this to happen due to the net being allowed to stretch outwardly. Additionally, in the amusement field, it is common to use a mesh with wide gap openings for climbing. Often however, the nets used in this manner also have play in both the vertical and horizontal directions making them less stable and hence less desirable to be used for children.

Accordingly, it is an object of the invention to provide an improved shrinking net whereby the net can be assembled onto a frame and the mesh thereafter shrunk in size to allow for tensioning of the mesh relative to the frame without having to allow for longer lengths of rope which otherwise would be needed for assembly purposes.

It is a further object of the invention to provide a device of the aforementioned type wherein a mesh can be quickly and easily retensioned after use.

It is still a further object of the invention to provide a net which can be interlocked at node points or at other locking points by causing portions of the rope cord to bind on itself and/or be connected to other rope components.

### SUMMARY OF THE INVENTION

The invention resides in a method and apparatus for tensioning a net which is made taut by wetting the net material such that the material shrinks when wetted and dried. More specifically, the invention resides in a net system comprising a frame having at least two opposing frame members and a net extending therebetween. The net is made from material of cords of a water soluble yarn capable of high shrinkage rates when wetted with water and dried. A means may be provided along one of the frame sides for causing tensioning of localized regions in the net.

The invention further resides in a method of tensioning a net to a frame by providing the net with a border, providing the net from material of cords of a water soluble yarn capable of high shrinkage rates when wetted with water and dried and sizing the net larger to be than the frame and mounting the net onto the frame such that the border is located outside of the frame and wetting the net and allowing it to dry such that the net shrinks around the frame taking up play otherwise existing prior to the wetting step.

## BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a plan view of a net embodying the invention.

Fig. 2 illustrates a net attached to a frame structure by means of eye bolts.

5 Fig. 3 illustrates a tensioning rod woven in the mesh  
at the outer border.

Fig. 4a illustrates the net installed in a frame prior to shrinkage.

Fig. 4b illustrates the net after tensioning by  
10 applying water.

Fig. 5 illustrates installing the net with the frame woven in the mesh, the frame could be pipe or other material.

Fig. 6 illustrates the net installed in the frame or  
15 structure with cable or rope.

Fig. 7 illustrates the net being installed to a cable using rings placed along the net border.

Fig. 8 illustrates a splice to a border with twisted rope.

20      Fig. 9a      illustrates an intersection of the net.

Fig. 9b illustrates the same as Fig. 9a but from other side.

Fig. 10b illustrates the rope of Fig. 10a except open for the further clarity.

Fig. 12 illustrates an end to end splice of a braided rope.

Fig. 14 illustrates an end to end splice of a twisted rope.

Fig. 15 illustrates another an end to end splice of a twisted rope.

Fig. 17 illustrates the material installed as a barrier, such as in a ball pit or children play unit.

Fig. 18 illustrates the material installed as shown in  
20 Fig. 16 except the material is rachel, knottless  
(knitted).

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 is a plan view of net 2, consisting of an outer border 4 and tucked construction, however, cross-lock construction is also possible, and material in addition to that disclosed in this invention can also be used, such as a core in a web rope, or a blend rope. The net 2 further is comprised of vertically extending weft members 6,6 and horizontally extending warp members 8,8 which intersect together with one another at intersections or nodes 10,10. The weft 6 and warp 8 member are made in whole or in part from a shrinkable material which will be discussed in greater detail later with respect TABLES A and B below.

Referring now to Fig. 2, it should be seen that the net 2 is attached to a rigid frame 5 through the intermediary of a plurality of eyebolts 12,12 which are threadedly connected within corresponding openings formed in and around the perimeter of the frame 5. The eyelet part of the eyebolts receive the border member 4 so as to pull the net 2 in both the X and Y coordinate directions and maintain the net 2 coextensively with the plane P.

As seen in Fig 3, in lieu of using eyebolts 12,12 exclusively around the perimeter of the frame 5, the number of eyebolts 12, 12 can be reduced by using a tensioning bar 22 provided along opposed side lengths of the border member 4. In the case of the vertical side of the border 4, the tensioning bar 22 is threaded between the warp members 8,8 and in the case of the horizontal sides of the border 4, the tensioning bar is threaded between the weft members 6,6. The use of the tensioning bars 22,22 allows for less securement points to be used between the frame and the net because the bars provide a



longer contact surface against which the border 4 acts, as opposed to the single point contact which exists with the direct eyebolt connection of Fig. 2. In addition, it should be seen that only one of the two opposing sides requires securement through eyebolt connection, thereby allowing the other opposite side to be secured via, for example a lashing connection 24 as shown along the bottom side of the net in Fig. 3.

Referring now to Figures 4a and 4b, it should be seen that the net 2 of the present invention is made from a material which comprises at least portions of the weft and warp members 6 and 8 and is capable of shrinking in sized once wetted. This material is better referred to as water soluble shrinkable yarns which react to wetting by reduction in length, up to the point where strain is imposed on the yarns by, for example, an outside force, such as produced, by reacting against a rigid frame.

The tables A and B below set forth the specific characteristics of the yarns which can comprise in whole or in part, the construction of the weft warp and border members. The yarns are sold by Kuraray Co. LTD. under the tradename, *Kuralon Type-T* rope, through Kawashima Trading Co. Ltd. , 1-6-28, Kyutaro-Machi, Chuo-ku, Osaka Japan.

TABLE A

1. Properties of Water Soluble Kuralon Perlohke Yarn

5

In addition to the soluble property in hot water, water soluble Kuralon perlohke yarn has the characteristic of remarkable high shrinkage force in water.

## 1. Characteristics of water soluble Kuralon perlohke yarn.

- (1) High shrinkage ratio in wet state.  
40% at free tension

10

- (2) High shrinkage force in wet state.

In case of 10's, the shrinkage force is about 30 gr. When the both ends of yarn are fixed.

- (3) High elongation at break.

- (4) At wet state it shows elasticity like rubber.

15

- (5) Abrasion resistance at wet state is a little inferior to that of normal Kuralon perlohke yarn.

- (6) Tensile strength is about half of normal Kuralon perlohke yarn.

- (7) It dissolves in water at more than 80°C.

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## 8) Standard Properties of Kuralon Yarn.

Description	2005P20/1T	2005P10/1T
Yarn Count	ECC 20'S	ECC 10'S
Dry		
Tensile Strength Kg	0.60	1.70
Tenacity g/dr.	2.20	3.01
Elongation %	15.0	17.0
Wet		
Tensile Strength Kg	0.25	0.49
Tenacity g/dr.	0.92	0.87
Elongation %	102	108

In addition to the specific characteristics above in Table A, below listed in TABLE B, are further characteristics illustrative of the yarn material used by the present invention.

TABLE B

## KURALON (PVA) HIGH SHRINKAGE CORD

This yarn exhibits the unique behavior of fast shrinkage combined with a high shrinkage force when it becomes wet.

## 5 1) Initial Reactive Properties

(a) Fast shrinkage:

The time required to reach 30% shrinkage is about 7 seconds in water at 20 Deg. C and about 4 seconds in water at 30 Deg. C.

10 (b) High shrinkage:

The shrinkage ratio is about 75% in water at 20 Deg. C. and about 78% in water at 30 Deg. C.

(c) High shrinkage force:

After absorbing water, a high shrinkage force is readily  
15      apparent. The shrinkage force is about 170 gram (0.1  
gram/danier) in water at 30 Deg. C after 10 seconds.

## 2) Long Term Properties

(a) High strength after shrinkage:

20           Strength is about 1 gram per denier after yarn is soaked  
              for 16 hours.

(b) Elasticity can be maintained for a long time.

### 3) Standard Properties

Denier :1786

Unit Length (meter/gram) : 5.0

Moisture Content (%) : 9.2

5      Strength (Kg)                                : 3.88

Tenacity (gram/dr) : 2.17

Elongation at Break (%) : 26.0

As seen in Figs. 4a and 4b, the net 2 is mounted onto a frame 5, such that a slack S exists between it and the frame 5. Thereafter water is applied through a hose 25 or the like and the net is caused to shrink to the point where it lies generally coextensively within the plane P. As seen in Fig. 5, one advantage of using a net which is capable of reducing its size is that the frame 5 can be assembled about the net taking advantage of the slack which can be provided for allowing the frame to be assembled. That is, the frame 5 conventionally will have an elbow 28 which connects with side members 29,29. Usually there will need to be some play allowed for in the net in order to allow the members 29,29 to be telescopically fitted within the elbow, or vice versa. This play or slack S is thus taken up by the subsequent shrinking step as discussed previously with respect to Figs. 4a and 4b. That is, if the net was manufactured to size, this frame would not be able to be assembled as the tubing would not be able to pull apart to allow the elbows or other fittings to telescope on the tubing/pipe.

In Fig.6, a locating cable 30 is used in lieu of either the several eyebolts of Fig. 2 or the rods 22 of Fig. 3. In this embodiment, the cable or rope is threaded through the weft and warp members immediately adjacent the border member 4. At the corners of the frame is disposed a single eyebolt 32 which is connected to the frame at a forty-five degree angle. As seen in Fig. 7, in lieu of a frame, the net 2 may be connected to a tensioned cable 34 through the intermediary of rings 36 which connect around the border 4 and the cable 34. It is noted that tensioning of the net members can be accomplished at any time once the net is mounted to the frame, including during the wetting and drying out periods.

Referring now to Fig. 8, it should be seen that the device shown in this embodiment covers a splice between a border and a twisted rope. Here, the border illustrated as 4 connects to a member 40, which for discussion purposes, can take the form of either a weft or warp member 6 or 8. As seen in Fig. 8, the member 40 is passed through one strand 42a of the border 4 separating the remaining members 42b and 42c in the border 4 and then is tucked under two or more strands 44a, 44b and 44c of itself. When wetted and allowed to dry in the manner discussed above and set forth in detail in Tables A and B, the passing through of the rope end back on itself prior to wetting causes a highly effective lock to be created.

Referring now to Figs. 9a and 9b, a structure of a node 10 is shown. The node 10 in Fig. 9a shows the intersection of weft and warp members 6 and 8. Here weft members 6 passes through warp member 8 at point 50 while warp member 8 passes through weft member 6 at point 52. When wetted and allowed to dry in the manner discussed

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above and set forth in detail in Tables A and B, the cross passing through of weft and warp members 6 and 8 prior to wetting causes a highly effective lock to be created.

- 5 The end structure shown in Figs. 10a and 10b illustrate the end of one of the warp or weft members which is capable of being connected through a retaining rod 22 such as shown in Fig. 3 or, alternatively, piercing through a border member as disclosed above with respect to Fig. 8. However, in this embodiment, it should be seen that the end 60 of the member 6/8 pierces back on itself through one cord of the rope at 64 and 65 after forming a loop 62 and then again pierces back on itself in an opposite 180° direction at point 66. By way of reference, such a double back type connected is disclosed in commonly owned U.S. Patent No. 5,622,094 entitled "Hollow Braid Net and Method of Making" issued on April 22, 1997 filed in the name of John Rexroad and filed on March 30, 1995 as application Serial No. 08/414,185, and which application being commonly owned with the Applicant of the present invention and is hereby incorporated by reference. When wetted and allowed to dry in the manner discussed above and set forth in detail in Tables A and B, the formation of end 60 of the member 6/8 piercing back on itself through one cord of the rope at 64 and 65 after forming a loop 62 and then again pierces back on itself in an opposite 180° direction at point 66 prior to wetting causes the a lock to be created in a highly effective manner.
- 30 Referring now to Fig. 11, it should be seen that the connection shown in Fig. 11 is that of shown in Figs. 9a and 9b, except that the material used as the weft and warp members 6 and 8 is that of a braided rope rather

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than a twisted one. Notwithstanding, intersection 10 is caused by the weft member 6 passing through the warp member 8 and then the warp member 8 passing through the weft member 6. It is further should be understood that the braided rope illustrated by the members 6 and 8 can be made completely of the shrinkable cord material of the Tables A and B above or can be braided with strands thereof which allows the member to have a soft touch such as when formed as a composite with a microfilament material. When wetted and allowed to dry in the manner discussed above and set forth in detail in Tables A and B, the formation of intersection 10 prior to wetting caused by the weft member 6 passing through the warp member 8 and then the warp member 8 passing through the weft member 6 is caused to lock on itself in a highly effective manner.

Referring now to Fig. 12, it should be seen that a splice 80 of a braided rope is shown. This splice 80 is made between two end to end pieces whose distal ends are shown at 82 and 84. Braided rope illustrated as 86 is passed through braided rope illustrated as 88 at point 90 and braided rope 88 passes through braided rope 86 at point 92. Thereafter, distal end 82 is turned 90° and passes through the side of braid rope 86 while distal end 84 of braid rope 86 is turned 90° and passes through the side of braid rope 88. When wetted and allowed to dry in the manner discussed above and set forth in detail in Tables A and B, the passed through rope portions of the rope members creates a highly effective lock.

Referring now to Fig. 13, it is seen that the structure shown in Fig. 13 is the same as that shown in Fig. 8, except that the ends of either the warp or weft members as represented by numeral 40 are separated and then



passed back in an over and under fashion into the double back portion of the rope member. When wetted and allowed to dry in the manner discussed above and set forth in detail in Tables A and B, the passing back over and under cords of the doubled back portion of the rope member effects a highly effective lock.

Referring now to Fig. 14, an end to end splice of braided rope 100 and 102 is shown. Here rope member 102 is passed between one cord member of rope 104 and rope 104 is passed under one cord member of rope 102 and the process is repeated linearly one or more times with both ends until no ends of the cord members are left dangling. When wetted and allowed to dry in the manner discussed above and set forth in detail in Tables A and B, the passing through of one rope member through the cord portion of the other rope member and vice versa effects a highly effective lock of the members.

As illustrated in Fig. 15, the splice between the twisted rope members 102 and 104 is accomplished by opening the ends of each of the members 102 and 104 and linearly splicing each end in an over-under fashion in the opposing rope. When wetted and allowed to dry in the manner discussed above and set forth in detail in Tables A and B, the splicing of each end of one rope member through that of the other and vice versa effects a highly effective lock of the members.

As illustrated in Fig. 16, the mesh 2 may be installed in a barrier, such as a fence, and is disposed between two horizontally spaced support rails 110 and 120 which, as typical, are secured by post(s) 122 to a support. The rails 120 and 110 may connect to the mesh 2 in the manner such as discussed previously with respect to Figs. 1-7.



CLAIMS

What is claimed is:

1. A net system comprising a frame having at least two opposing frame members and a net extending therebetween;

said net being made from a material of cords of a water soluble yarn capable of high shrinkage rates when wetted with water and dried; and

means provided along one of said frame sides for causing tensioning of localized regions in said net.

2. A system as defined in claim 1 further characterized by said net being comprised of weft members and perpendicularly extending warp members connected to a border member which intersect together with one another at intersections or nodes, and wherein one of said border, weft and warp members is made in whole or in part from a shrinkable material when wetted and dried.

3. A system as defined in claim 1 further characterized by said tensioning means includes a connecting rod extending along one of said frame members and threaded between the border one the weft and warp members.

4. A system as defined in claim 2 further characterized in that said frame includes a plurality of

adjustment bolts which receive a border member of said net.

5        5.        A system as defined in claim 2 further characterized in that the net is installed on a frame prior to shrinkage.

10       6.       A system as defined in claim 2 further characterized in that a locating cable is provided and is threaded through the weft and warp members immediately adjacent the border member and at the corners of the frame is disposed a single eyebolt which is threaded to the frame at a forty-five degree angle.

15       7.       A system as defined in claim 2 further characterized in that said net includes a splice between said border and a weft or warp member, said splice includes a twisted warp or weft member and a twisted cord border member which weft or warp member is passed through one strand of the border member separating the remaining members in the border member and then is tucked under two or more strands of itself and then wetted and allowed to dry.

25       8.       A system as defined in claim 2 further characterized in that said net includes node at the intersection of weft and warp members wherein the weft member passes through warp member and the warp member passes through weft member and then wetted and allowed to dry.

30       9.       A system as defined in claim 2 further characterized in that said warp or weft members have an eyelet formed by the end of the weft or warp member piercing back on itself through one cord of the weft or

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warp member after forming a loop and then again piercing back on itself in an opposite 180° direction and wetted and allowed to dry.

10. A system as defined in claim 2 further characterized in that said net includes a splice of a braided rope made between two end to end pieces, wherein one rope is passed through the other rope and the other rope passes through the one rope and thereafter the distal end of the one rope is turned 90° and passes through the side of the other rope while distal end of the other rope is turned 90° and passes through the side of the one rope braid rope, the two ropes are locked together once wetted and dried.

11. A system as defined in claim 2 further characterized in that said net includes the warp or weft members each having a loop at one end thereof created by separating the end cords thereof and then passed back the separated cords back in an over and under fashion into the double back portion of the rope member and locking the doubled back portion by wetting and then drying.

12. A system as defined in claim 2 further characterized in that said net includes an end to end splice of braided rope wherein one rope member is passed between one cord member of the other rope and the other rope is passed under one cord member of the one rope and the process is repeated linearly one or more times with both ends until no ends of the cord members are left dangling, the passing of rope members is locked by wetting and then drying of the one and the other rope members.

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sizing the net larger than said frame and mounting the net onto the frame such that the border is located outside of the frame and wetting the net and allowing it to dry such that the net shrinks around the frame taking up play otherwise existing prior to the wetting step.

14. A net comprising:

a plurality of weft members and perpendicularly  
extending warp members connected to a border  
member which intersect together with one  
another at intersections;

one of said border, weft and warp members is  
made in whole or in part from a shrinkable  
material capable of high shrinkage rates when  
wetted with water and dried;

means provided along one of said frame sides  
for causing tensioning of localized regions in  
said net after said net is wetted with water;  
and.

wherein said material being used to lock  
connections between said weft and warp members  
and/or said border member.

15. A net as defined in claim 14 further  
characterized in that said net includes a splice between  
said border and a weft or warp member, said splice  
includes a twisted warp or weft member and a twisted cord  
border member which weft or warp member is passed through  
one strand of the border member separating the remaining  
members in the border member and then is tucked under two  
or more strands of itself and then wetted and allowed to  
dry.

16. A net as defined in claim 14, further characterized in that said net includes node at the intersection of weft and warp members wherein the weft member passes through warp member and the warp member passes through weft member and then wetted and allowed to dry.

17. A net as defined in claim 14 further characterized in that said warp or weft members have an eyelet formed by the end of the weft or warp member piercing back on itself through one cord of the weft or warp member after forming a loop and then again piercing back on itself in an opposite 180° direction and wetted and allowed to dry.

18. A net as defined in claim 14 further characterized in that said net includes a splice of a braided rope made between two end to end pieces, wherein one rope is passed through the other rope and the other rope passes through the one rope and thereafter the distal end of the one rope is turned 90° and passes through the side of the other rope while distal end of the other rope is turned 90° and passes through the side of the one rope braid rope, the two ropes are locked together once wetted and dried.

19. A net as defined in claim 14 further characterized in that said net includes the warp or weft members each having a loop at one end thereof created by separating the end cords thereof and then passed back the separated cords back in an over and under fashion into the double back portion of the rope member and locking the doubled back portion by wetting and then drying.



20. A net as defined in claim 14 further characterized in that said net includes an end to end splice of braided rope wherein one rope member is passed between one cord member of the other rope and the other rope is passed under one cord member of the one rope and the process is repeated linearly one or more times with both ends until no ends of the cord members are left dangling, the passing of rope members is locked by wetting and then drying of the one and the other rope members.

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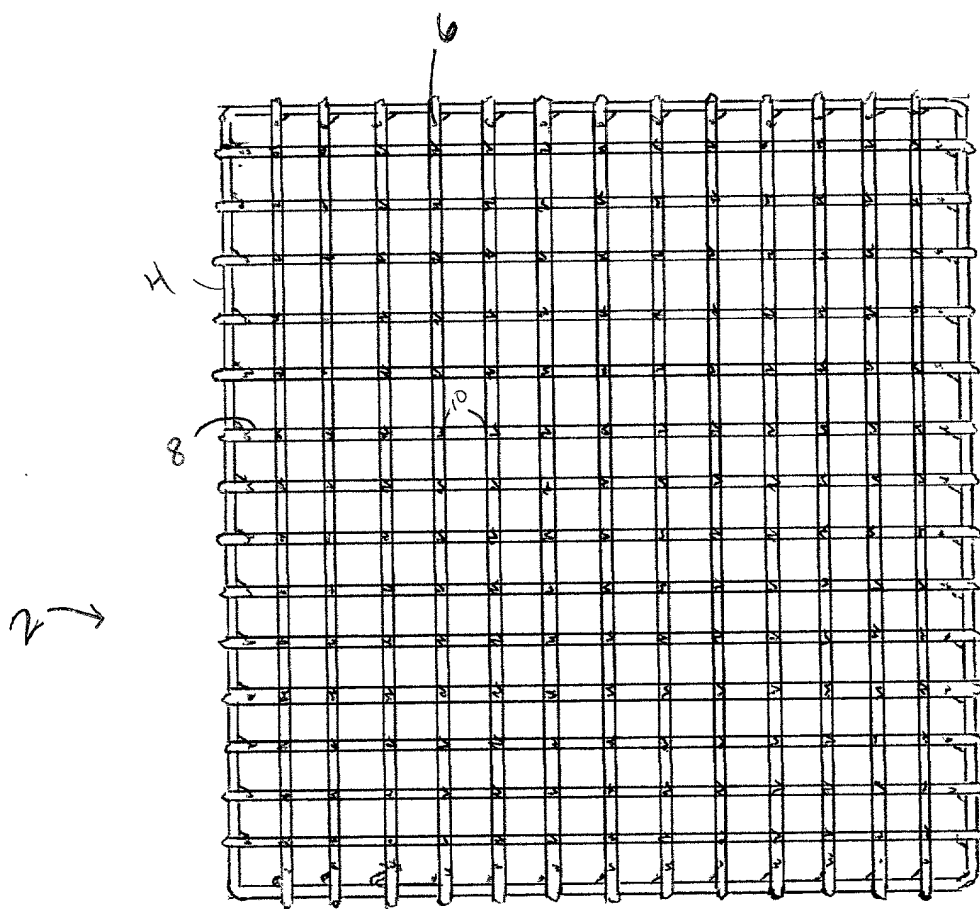


FIG. 1

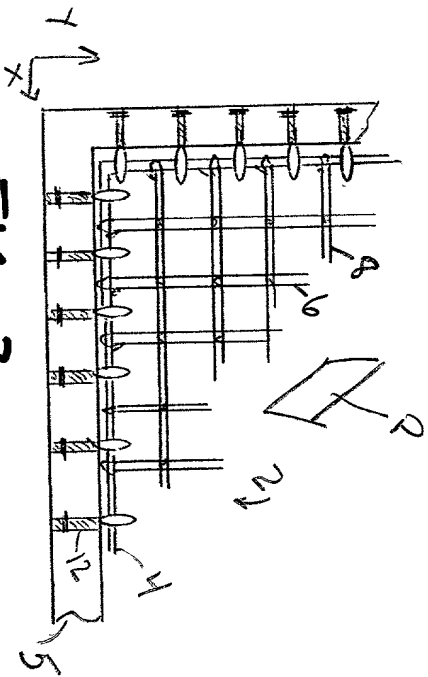


FIG. 2

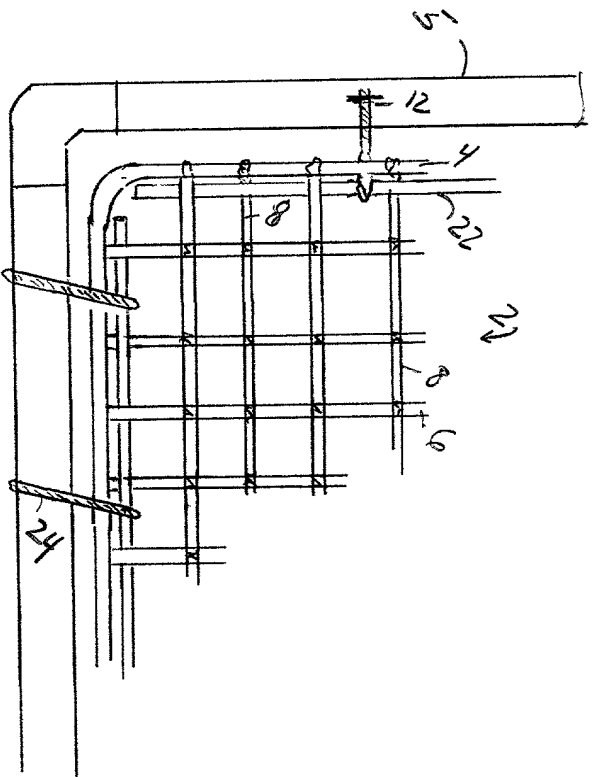


FIG. 3

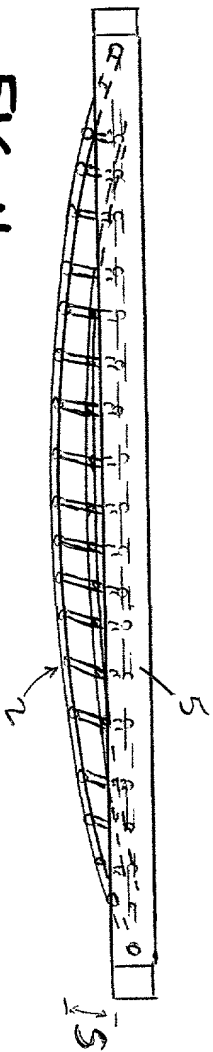


FIG. 4a

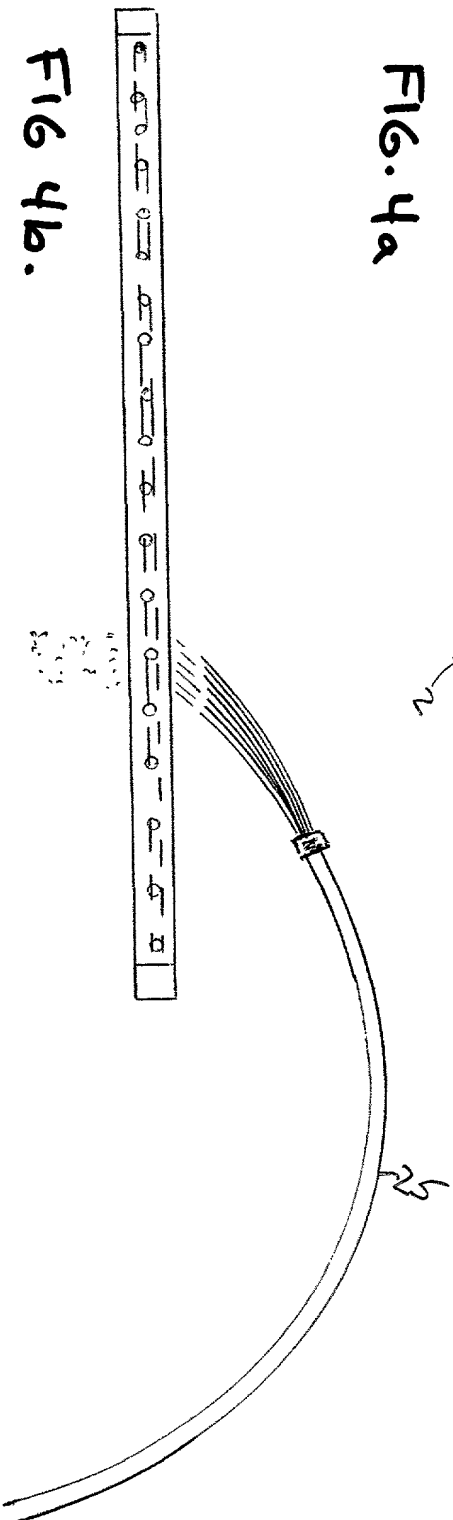
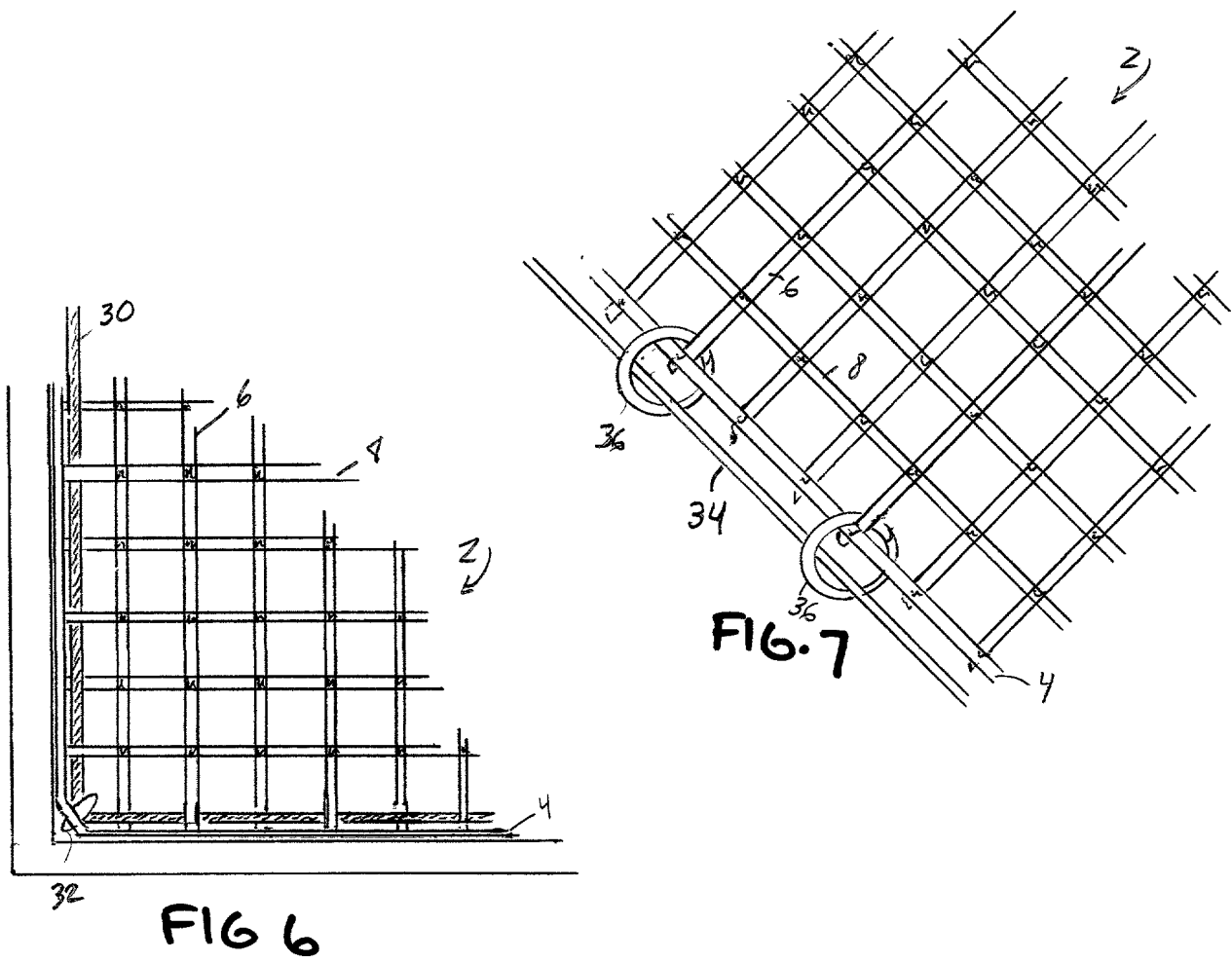
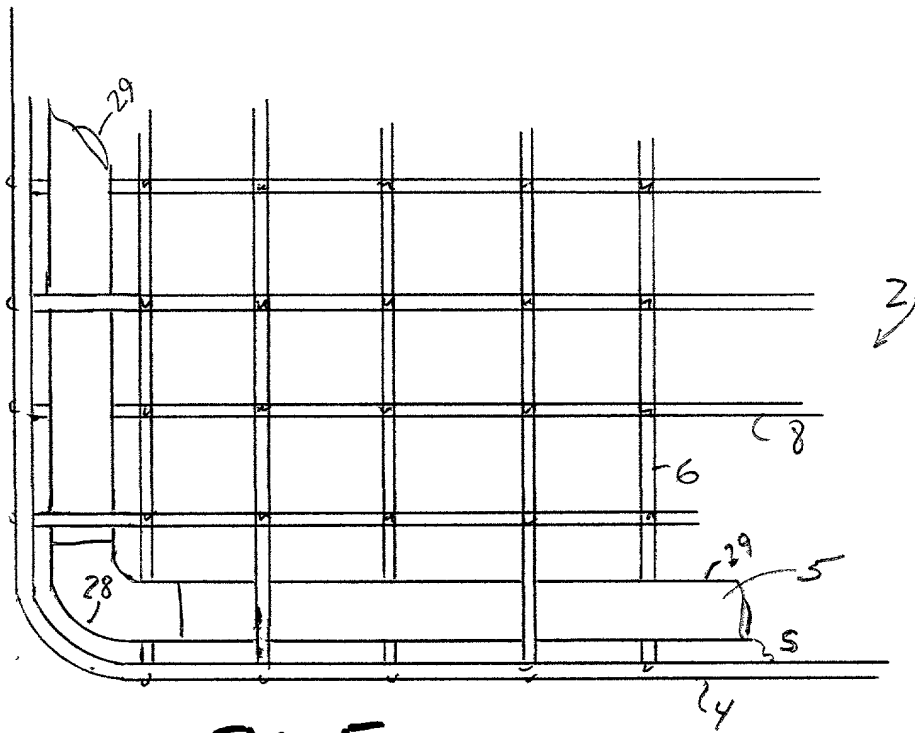


FIG. 4b.



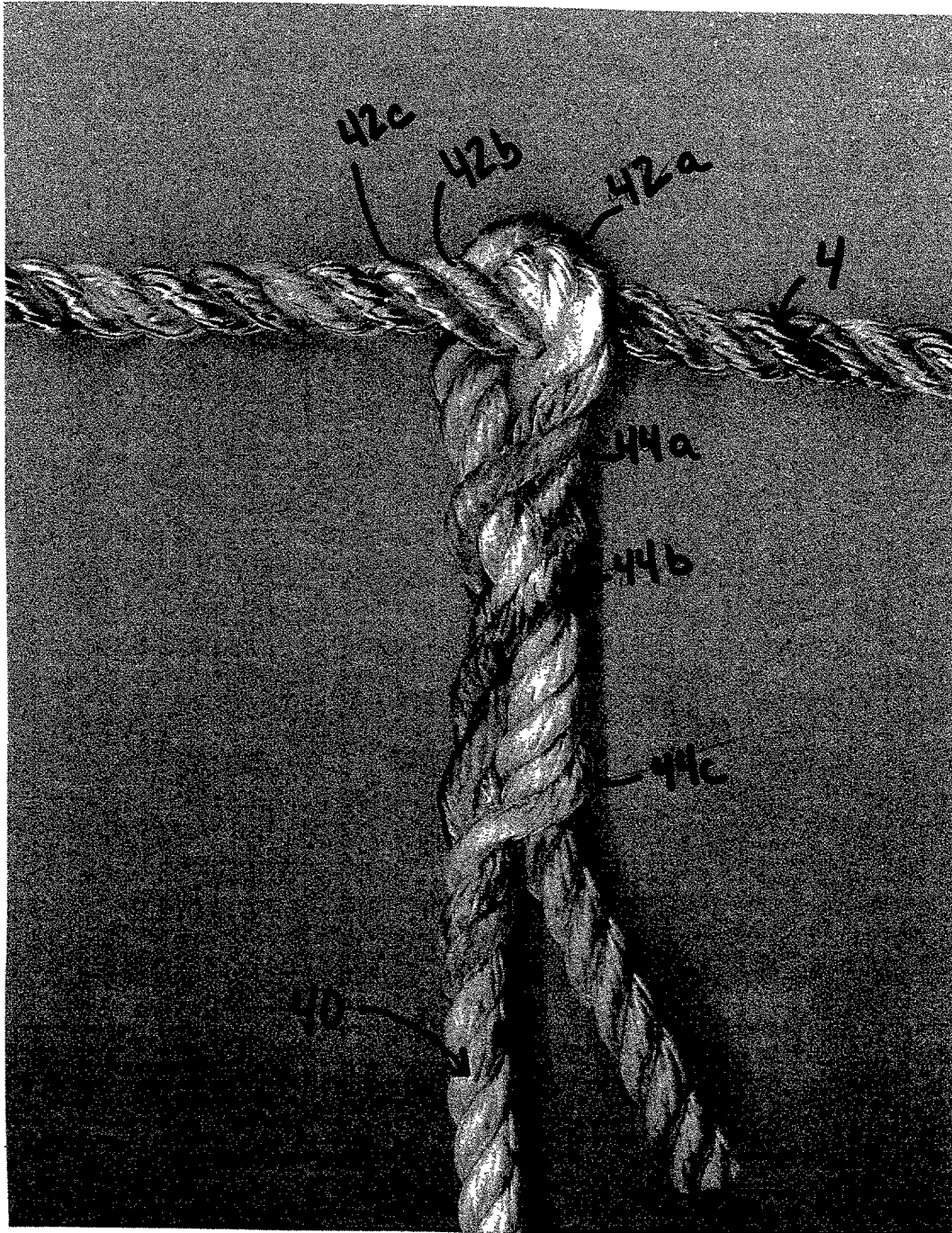


FIG.8

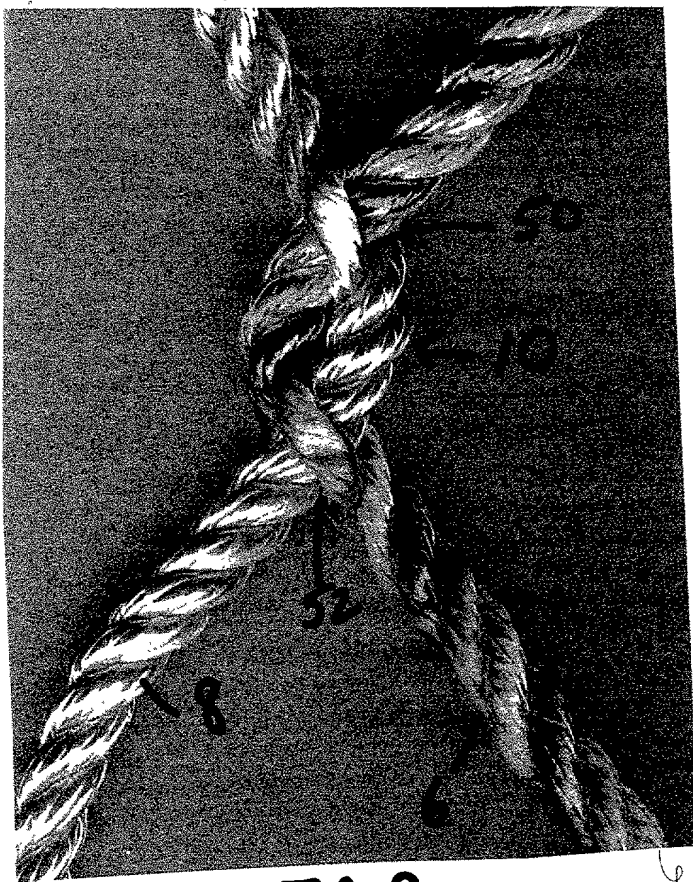


FIG. 9a



FIG. 9b

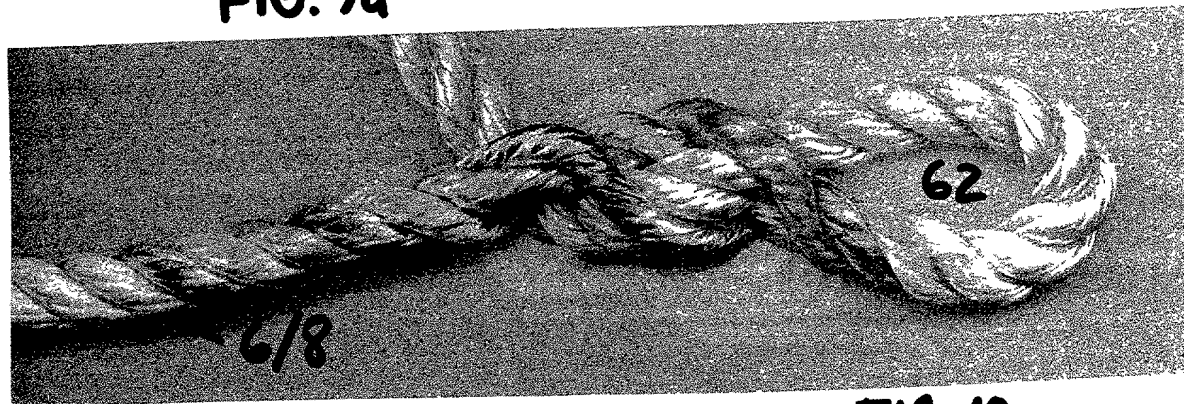


FIG. 10a

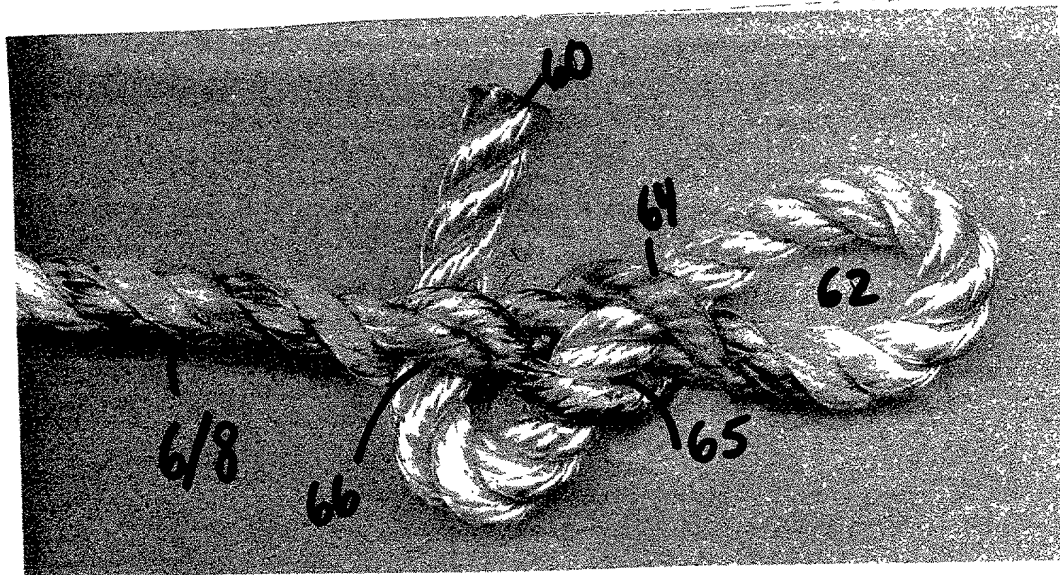


FIG. 10b



FIG. 12





FIG. 13

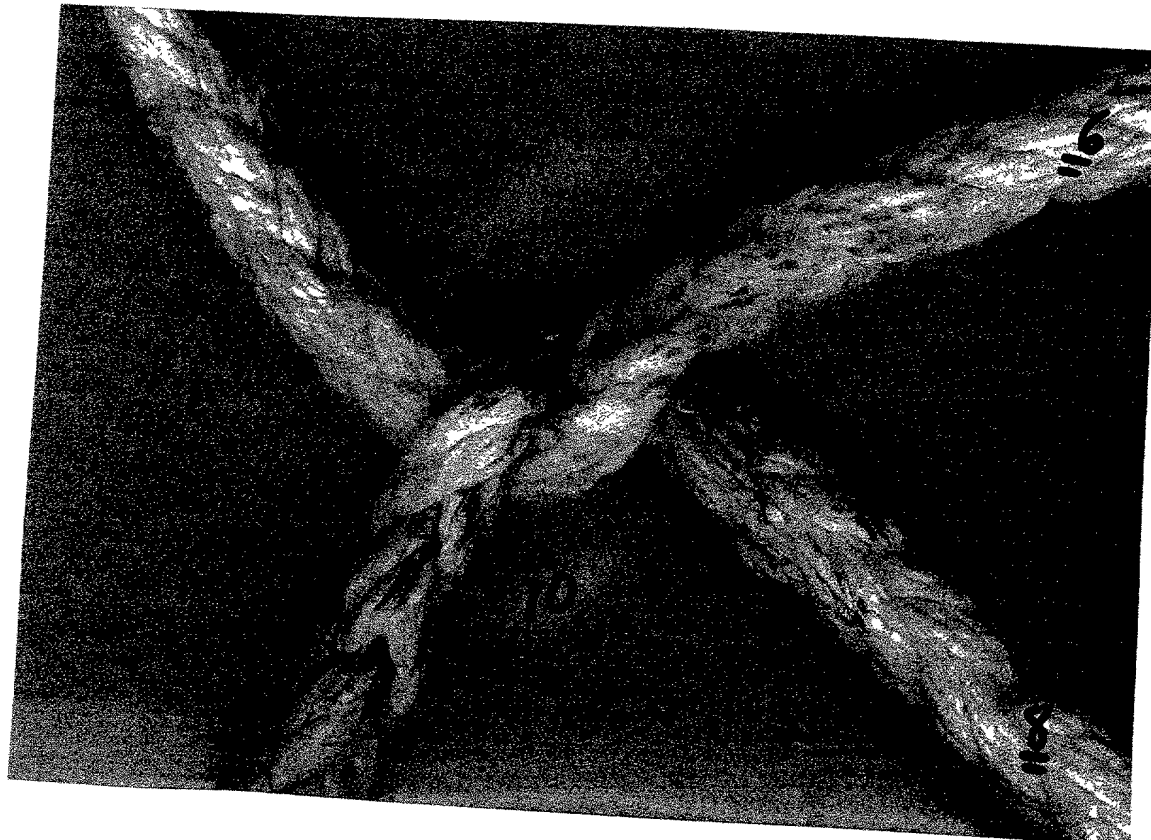


FIG. 11

Fig. 14

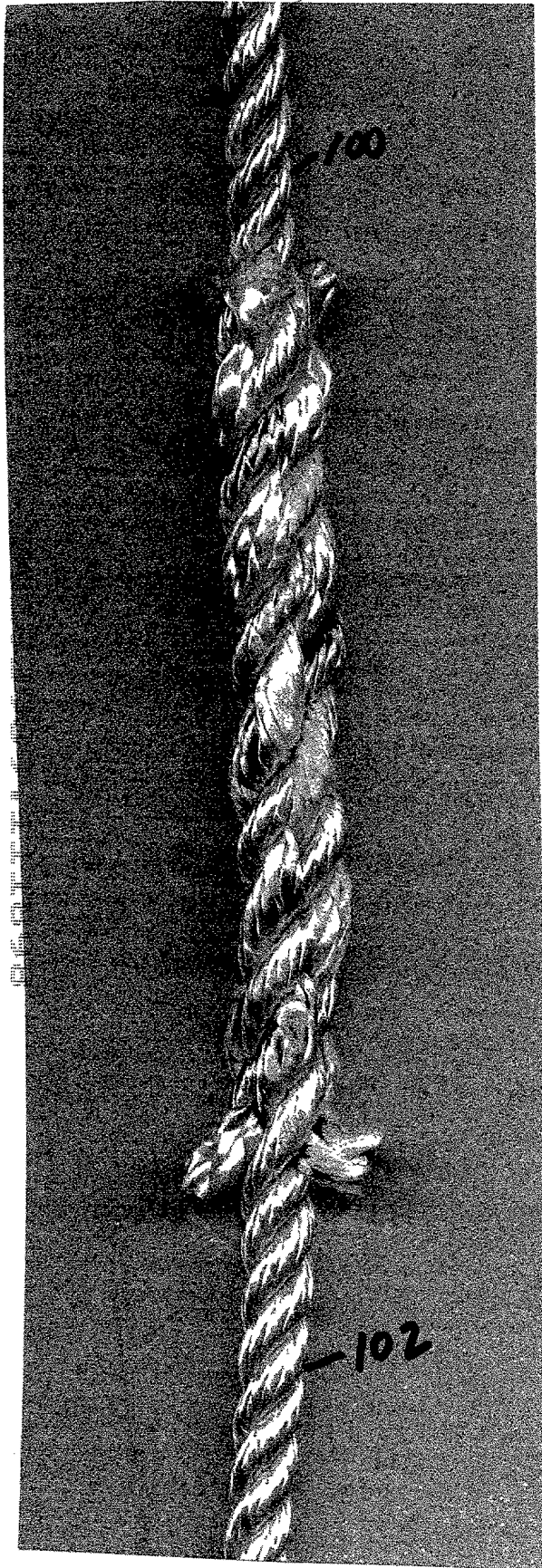
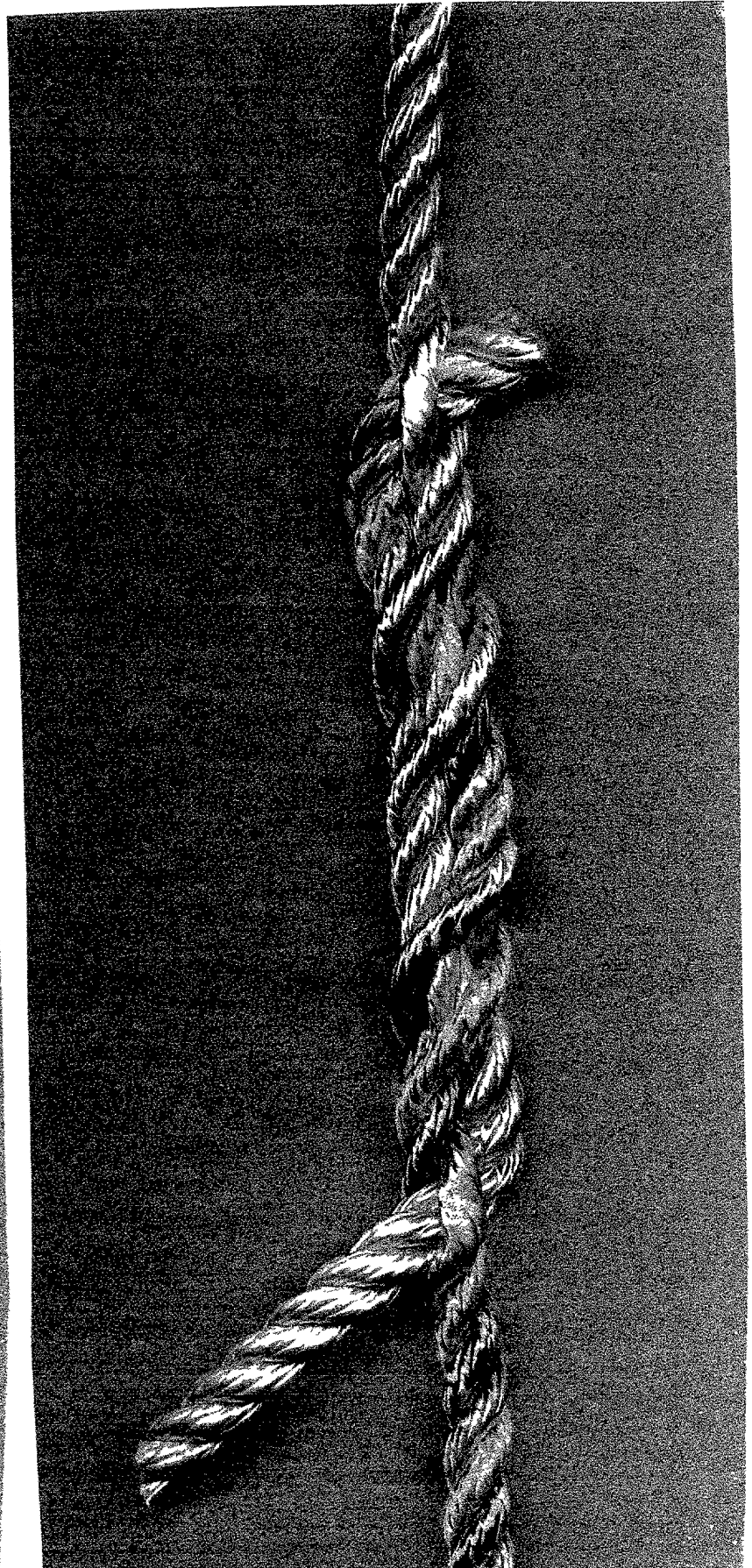
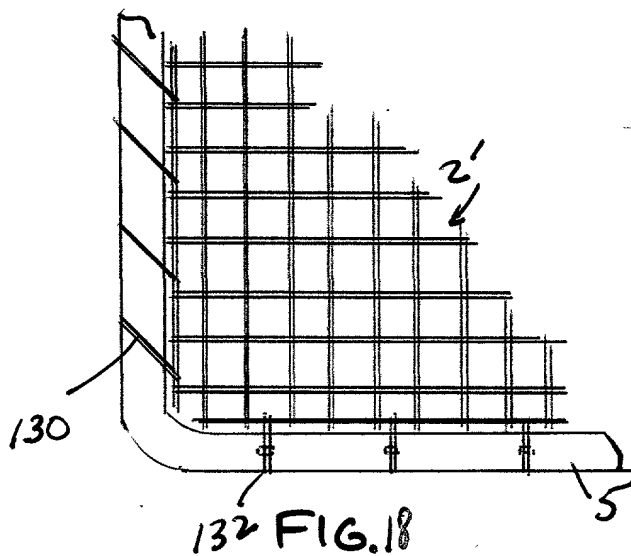
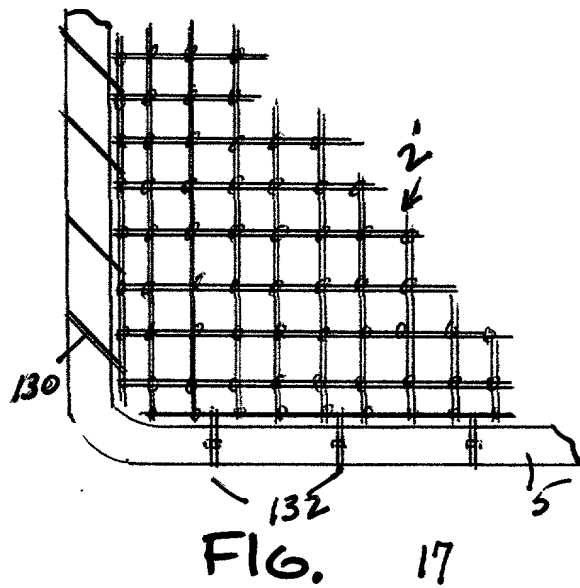
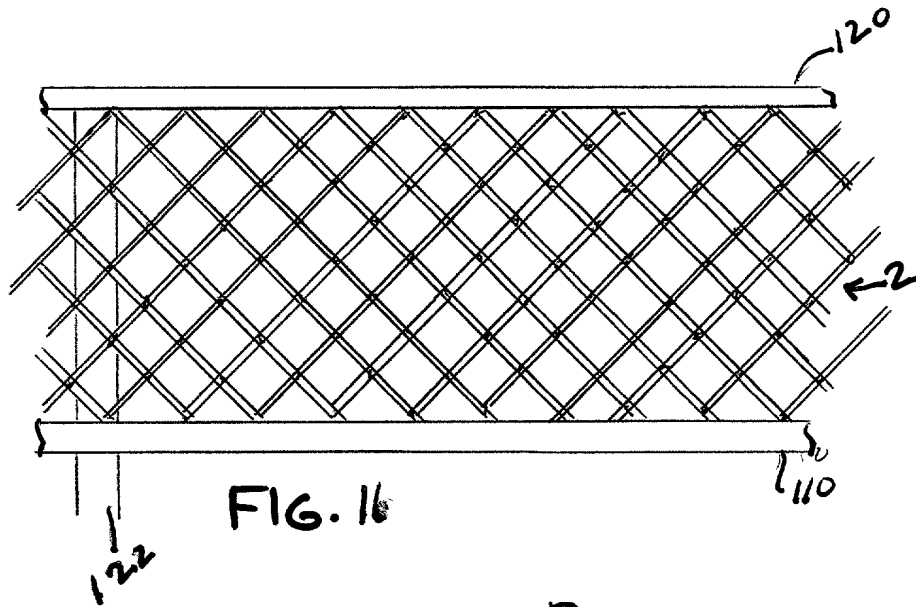


Fig. 15





**COMBINED DECLARATION AND POWER OF ATTORNEY**

(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL,  
CONTINUATION, OR C-I-P)

As a below named inventor, I hereby declare that:

**TYPE OF DECLARATION**

This declaration is of the following type:

(check one applicable item below)

- ☒ original.  
☐ design.  
☐ supplemental.

NOTE: If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items. -

- ☐ national stage of PCT.

NOTE: If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR C-I-P.

NOTE: See 37 C.F.R. § 1.63(d) (continued prosecution application) for use of a prior nonprovisional application declaration in the continuation or divisional application being filed on behalf of the same or fewer of the inventors named in the prior application.

- ☐ divisional.  
☐ continuation.

NOTE: Where an application discloses and claims subject matter not disclosed in the prior application, or a continuation or divisional application names an inventor not named in the prior application, a continuation-in-part application must be filed under 37 C.F.R. § 1.53(b) (application filing requirements — nonprovisional application).

- ☐ continuation-in-part (C-I-P).

**INVENTORSHIP IDENTIFICATION**

**WARNING:** If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

**TITLE OF INVENTION**

Shrink-Net and System

09193909-11090

## SPECIFICATION IDENTIFICATION

the specification of which:

(complete (a), (b), or (c))

(a) ☒ is attached hereto.

NOTE: "The following combinations of information supplied in an oath or declaration filed on the application filing date with a specification are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

"(1) name of inventor(s), and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration on filing;

"(2) name of inventor(s), and attorney docket number which was on the specification as filed;  
or

"(3) name of inventor(s), and title which was on the specification as filed."

Notice of July 13, 1995 (1177 O.G. 60).

(b) ☐ was filed on \_\_\_\_\_, as ☐ Serial No. 0 / \_\_\_\_\_  
or ☐ \_\_\_\_\_  
and was amended on \_\_\_\_\_ (if applicable).

NOTE: Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 CFR 1.67.

NOTE: "The following combinations of information supplied in an oath or declaration filed after the filing date are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

"(1) name of inventor(s), and application number (consisting of the series code and the serial number; e.g., 08/123,456);

"(2) name of inventor(s), serial number and filing date;

"(3) name of inventor(s) and attorney docket number which was on the specification as filed;

"(4) name of inventor(s), title which was on the specification as filed and filing date;

"(5) name of inventor(s), title which was on the specification as filed and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or

"(6) name of inventor(s), title which was on the specification as filed and accompanied by a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number; e.g., 08/123,456), or serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration."

Notice of July 13, 1995 (1177 O.G. 60).

(c) ☐ was described and claimed in PCT International Application No. \_\_\_\_\_, filed on \_\_\_\_\_ and as amended under PCT Article 19 on \_\_\_\_\_ (if any).

Variable	Mean	SD	Median	Mode	Range	Skewness	Kurtosis	Shapiro-Wilk	Levene
Age	35.2	12.5	32.0	30.0	20-55	0.15	2.10	0.98	0.95
Gender	1.2	0.4	1.0	1.0	1-2	0.05	0.10	0.99	0.98
Marital Status	1.5	0.5	1.0	1.0	1-3	0.10	0.20	0.99	0.98
Education	12.5	2.0	12.0	12.0	10-15	0.05	0.10	0.99	0.98
Income	1500	500	1200	1000	500-2500	0.20	1.50	0.95	0.90
Occupation	1.8	0.6	1.5	1.5	1-3	0.10	0.20	0.99	0.98
Health Status	2.5	0.8	2.0	2.0	1-4	0.15	0.30	0.98	0.95
Stress Level	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Life Satisfaction	4.0	1.0	4.0	4.0	3-5	0.05	0.10	0.99	0.98
Resilience	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Emotional Stability	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Self-Esteem	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Optimism	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Gratitude	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Forgiveness	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Empathy	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Compassion	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Kindness	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Patience	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Humility	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Modesty	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Generosity	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Generous	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Altruism	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Selflessness	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Unselfish	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Disinterested	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Impartial	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Unbiased	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Objective	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Unprejudiced	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Unbiased	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Unprejudiced	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Unbiased	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Unprejudiced	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Unbiased	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Unprejudiced	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Unbiased	3.5	1.0	3.0	3.0	2-5	0.15	0.30	0.98	0.95
Unprejudiced	3.0	1.0	2.5	2.0	1-5	0.20	0.50	0.95	0.90
Unbiased	3.5	1.0	3.0	3.0	2-5	0.15			

☐ I hereby declare that the subject matter of the

☐ attached amendment

☐ amendment filed on \_\_\_\_\_

## ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

(also check the following items, if desired)

- PRIORITY CLAIM** (35 U.S.C. §§ 119(a)-(d))

I hereby claim foreign priority benefits under Title 35, United States Code, §§ 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(d) ☒ no such applications have been filed.

(e) ☐ such applications have been filed as follows.

(Declaration and Power of Attorney [1-1]—page 3 of 7)



**ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS  
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

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NOTE: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete **ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION** for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.

**POWER OF ATTORNEY**

I hereby appoint the following practitioner(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

*(list name and registration number)*

Clarence A. Green (24,622)  
Joseph A. Fischetti (32,656)  
Mark F. Harrington (31,686)  
Harry F. Smith (32,493)

*(check the following item, if applicable)*

- ☐ I hereby appoint the practitioner(s) associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.
- ☐ Attached, as part of this declaration and power of attorney, is the authorization of the above-named practitioner(s) to accept and follow instructions from my representative(s).

---

SEND CORRESPONDENCE TO

DIRECT TELEPHONE CALLS TO:  
*(Name and telephone number)*

☐ Address

Joseph A. Fishetti  
Perman & Green, LLP  
425 Post Road  
Fairfield, CT 06430

Joseph A. Fischetti  
(203) 259-1800

☐ Customer Number \_\_\_\_\_

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## DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

## SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.

Full name of sole or first inventor

John		Rexroad
(GIVEN NAME)	(MIDDLE INITIAL OR NAME)	FAMILY (OR LAST NAME)

Inventor's signature \_\_\_\_\_

Date \_\_\_\_\_ Country of Citizenship USA

Residence Killingworth, Connecticut

Post Office Address 12 Jackson Road, Killingworth, CT 06419

Full name of second joint inventor, if any

_____	_____	_____
(GIVEN NAME)	(MIDDLE INITIAL OR NAME)	FAMILY (OR LAST NAME)

Inventor's signature \_\_\_\_\_

Date \_\_\_\_\_ Country of Citizenship \_\_\_\_\_

Residence \_\_\_\_\_

Post Office Address \_\_\_\_\_

Full name of third joint inventor, if any

_____	_____	_____
(GIVEN NAME)	(MIDDLE INITIAL OR NAME)	FAMILY (OR LAST NAME)

Inventor's signature \_\_\_\_\_

Date \_\_\_\_\_ Country of Citizenship \_\_\_\_\_

Residence \_\_\_\_\_

Post Office Address \_\_\_\_\_

636377 636377 636377

(check proper box(es) for any of the following added page(s)  
that form a part of this declaration)

- ☐ **Signature** for fourth and subsequent joint inventors. *Number of pages added* \_\_\_\_\_

\* \* \*

- ☐ **Signature** by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. *Number of pages added* \_\_\_\_\_

\* \* \*

- ☐ **Signature** for inventor who refuses to sign or cannot be reached by person authorized under 37 CFR 1.47. *Number of pages added* \_\_\_\_\_

\* \* \*

- ☐ Added page for **signature** by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 CFR 1.47)

\* \* \*

- ☐ Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.

☐ Number of pages added \_\_\_\_\_

\* \* \*

- ☐ Authorization of practitioner(s) to accept and follow instructions from representative.

\* \* \*

(if no further pages form a part of this Declaration,  
then end this Declaration with this page and check the following item)

- ☒ This declaration ends with this page.